



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/743,985	12/22/2003	Shui-Ming Cheng	N1085-00168	9060
8933	7590	02/26/2008		
DUANE MORRIS, LLP IP DEPARTMENT 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103-4196			EXAMINER SCHILLINGER, LAURA M	
			ART UNIT 2813	PAPER NUMBER
			MAIL DATE 02/26/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/743,985

**Applicant(s)**

CHENG ET AL.

**Examiner**

Laura M. Schillinger

**Art Unit**

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-19 and 36-46 is/are pending in the application.  
4a) Of the above claim(s) 13 and 36-46 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11, 12 and 14-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of claims 11-12, 14-19 in the reply filed on 11/30/07 is acknowledged. The traversal is on the ground(s) that claim 41 is generic and that claims 37-39 read on the elected specie due to their dependency upon claim 11. This is not found persuasive because the dependent nature of claims 37-39 does not prevent the claims from containing mutually exclusive characteristics requiring an additional and burdensome search as in this case. However it is noted that should claim 11 be determined to be allowable, the dependent claims which act only to further narrow the allowable subject matter may be rejoined and allowed. Moreover, claim 41 is not generic because it requires a second oxide region comprising only the oxide layer- this is a mutually exclusive characteristic from that of the elected specie.

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 11-12, 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over King et al., "Sub-5 um Multiple-Thickness Gate Oxide Technology Using Oxygen Implantation," Int. Electron Device Meeting (IEDM), San Francisco, paper 21.1.1 (1998).

King teaches the following claimed limitations as cited below:

11. A device having a gate comprising:

O ions providing discrete implants (Col.4, lines: 50-60) regions in a substrate of a device (Introduction), the discrete implant regions extending to a surface of the substrate; and

One or more additional gate regions covering all discrete implant regions under the one or more additional gate regions (Fig.1- deposit polygate), and

a gate oxide layer covering but not encroaching the discrete implant regions and being under the one or more additional gate regions (Introduction/New Technology), being under the one or more additional gate regions, the discrete implant regions forming gate oxide regions and reducing substrate resistance under each of the additional gate regions. (Fig.3).

However, King et al teaches that the substrate is made of silicon but fails to specify that the substrate is SOI. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify King's teachings to include an SOI substrate. Such substrates are well known and conventional in the semiconductor art and it would have been understood that silicon substrates may include SOI. (See Sakaguchi 5492859- teaching SOI substrates are well known- Col.1, lines: 20-30).

12. The device of claim 11, further comprising:

implanted ions in the substrate, the one or more additional gate regions covering the implanted ions (New Technology).

14. The device of claim 11, further comprising:

a gate of the device (Fig.1).

15. The device of claim 11, further comprising

a gate electrode layer forming a device gate and the one or more additional gate regions (Fig.1).

16. The device of claim 11, further comprising:

a device gate and the one or more additional gate regions being formed from a gate electrode layer (Fig.1); and

wherein the gate oxide layer is under the gate and under the one or more additional gate regions (Fig.1).

17. The device of claim 11, further comprising:

the gate oxide layer including a thin gate oxide layer having a thicker gate oxide covering the ions (Fig.1);

a device gate on the thin gate oxide layer (Fig.1); and

the one or more additional gate regions being on the thicker gate oxide (Fig.1).

18. The device of claim 11, further comprising:

the thicker gate oxide being a selective epitaxy growth (Introduction).

19. The device of claim 11, further comprising

the substrate having STI enclosures for the ions (Col.4, lines: 25-35). King teaches to implement LOCOS isolation, but fails to specify STI isolation as recited in claim 19. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify King's teachings to include STI rather than LOCOS because both effectuate the same results and are well known interchangeable isolation techniques. See Lojek et al 5851892- Col.9, lines: 1-5 teaching that LOCOS or STI can be used as isolation techniques and are well known in the art).

### ***Response to Arguments***

Applicant's arguments filed 7/5/07 have been fully considered but they are not persuasive. Applicant's argue that the claim language is distinguished from King because of the

following: King teaches implanting oxygen ions then forming a gate oxide from the implanted oxygen ions. King's oxide is a thermal oxide grown from the implanted oxygen and it encroaches the original substrate surface and includes a greater thickness (see FIG. 1(a), bottom) in the doped oxide regions than in the undoped regions. In contrast, the claims require implanting oxygen atoms into a substrate to form a discrete oxide section within the substrate, then forming a gate oxide layer over" the discrete oxide implant regions formed in the substrate (i.e. not encroaching the discrete oxide sections in the substrate): This argument is not persuasive because 1) Fig.1(a) does not depict encroaching – the figure depicts depositing a thermal oxidation layer on top of the implanted oxide regions. Applicant's arguments that King teaches encroachment is not persuasive because King does not explicitly teach encroachment moreover, King does not depict it in the figures. Furthermore, in the New Tehnology section of King- King explicitly teaches to carry out thermal oxidation in addition to implanting in order to form an additional gate oxide layer. Therefore such arguments are not persuasive.

Lastly, Applicant's traversal of the withdrawing of newly added claims is not persuasive.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura M. Schillinger whose telephone number is (571) 272-1697. The examiner can normally be reached on M-T, R-F 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead, Jr. can be reached on (571) 272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Laura M Schillinger/  
Primary Examiner, Art Unit 2813

02/17/08



